SMC Networks

N e t w o r k s

USER GUIDE

Compliances

FCC - Class B
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
• Reorient the receiving antenna
• Increase the separation between the equipment and receiver
• Connect the equipment into an outlet on a circuit different from that to which
the receiver is connected
• Consult the dealer or an experienced radio/TV technician for help

FCC Caution: To assure continued compliance, (for example - use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION STATEMENT:
FCC Radiation Exposure Statement
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 5 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other
antenna or transmitter. Note: In order to maintain compliance with the limits of a Class B digital device, SMC requires that you use a quality interface cable when connecting to this device. Changes or modifications not expressly approved by SMC could void the user's authority to operate this equipment.
Attach unshielded twisted-pair cable (UTP) to the RJ-45 port and shielded USB cable to the USB port.

Industry Canada - Class B
This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par l'Industrie.

EC Conformance Declaration – Class B
SMC contact for these products in Europe is:

SMC Networks Europe,
Edificio Conata II
Calle Fructuos Gelabert 6-8, 2o, 4a
08970 – Sant Joan Despi
Barcelona, Spain

This information technology equipment complies with the essential requirements of the R&TTE Directive 1999/5/EC and all other related provisions of this directive.

Important Safety Notices
- Unplug this product from the AC power before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a dry cloth for cleaning.
- Route the power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.
- Situate the product away from heat sources such as radiators, heat registers, stoves, and other products that produce heat.
- To prevent fire or shock hazard, do not expose this unit to rain or moisture. Do not allow water or any foreign objects to enter the interior. This may cause a fire or electric shock. In the event that water or other foreign objects get into the product, immediately unplug the AC adapter from the electrical outlet and contact Customer Service for inspection and/or repair/replacement options.
- Do not take apart the equipment. This may cause fire, electric shock or other injuries.
- Do not overload wall outlets and extension cords as this can result in a fire or electric shock.
- This product is for use with the AC adapter that comes with it. Use with any other AC power is strongly discouraged as it may cause fire, electric shock, or damage to the equipment.

1 | System Requirements

- An available USB port
- Windows 98SE/Me/2000/XP
- A minimum of 10 MB of free disk space for installing the driver and utility program.
- Another IEEE 802.11b or 802.11g compliant device installed in your network, such as the SMC7004VWBR Barricade™ Wireless Broadband Router, or another PC with a wireless adapter.

2 | Equipment Checklist

After unpacking the SMCWUSB32 EZ Connect™ 11 Mbps Wireless USB Flash Drive, check the contents of the box to be sure you have received the following components:

- 1 SMCWUSB32 11 Mbps Wireless USB Flash Drive
- 1 EZ Installation Wizard and Documentation CD
- 1 Laptop Clip
- 1 USB Extension Cable
- 1 Quick Installation Guide

Immediately inform your dealer in the event of any incorrect, missing or damaged parts. If possible, please retain the carton and original packing materials in case there is a need to return the product.

Please register this product and upgrade the product warranty at SMC's Web site: http://www.smc.com

3 | Installation Instructions

- Device Installation
1) Select an available USB port on the PC
2) Make sure the cap of the SMCWUSB32 is pushed down so that the USB interface is clearly visible
3) Carefully insert the USB adapter's Type-A plug (i.e., the flat plug) into the USB port
4) Press until it is firmly seated in the port

- Using the Laptop Clip and USB Extension Cable
1) Select an available USB port on the PC
2) Make sure the cap of the SMCWUSB32 is pushed down so that the USB interface is clearly visible
3) Hold the cap in place while sliding the Laptop Clip onto the cap of the SMCWUSB32. Make sure the Laptop Clip is held firmly in place.
4) Carefully insert the USB cable's Type-A plug (i.e., the flat plug) into the USB port and press until it is firmly seated in the port
5) Insert the other end of the cable into the SMCWUSB32 11 Mbps Wireless USB Flash Drive

4 | Flash Drive Installation

NOTE: Installation processes may require the use of your original, licensed copy of Windows. Please have your Windows CD available BEFORE proceeding with the installation. The following instructions are for Windows 98SE/Me. Under Windows 2000/XP, your Flash Drive should be automatically installed once you plug the SMCWUSB32 into your USB port.

Windows 98SE

Step 1: After you have inserted the SMCWUSB32 into your USB port, the Operating System will recognize the adapter and prompt you for the appropriate drivers. Click the [Next >] button to begin the installation.

Step 2: Insert the EZ Installation Wizard and Documentation CD and select the [Search for the best driver for your device] option and click [Next >].

Step 3: Clear all checkboxes except for [Specify a location:]. Then press the [Browse] button and look for the drivers on your CD-ROM. Browse to ?:\Flash Driver. (Note: The "?" equals the letter of your CD-ROM drive. In most cases, this is **D**.)

Step 4: The system should find the drivers. Click the [Next >] button to continue the installation. The wizard will show "UStorage Drive".

Step 5: Once the system has copied the SMC drivers from the CD, it may then request files from your original Windows disk. Please insert the Windows CD at this time.

Step 6: The system will copy the files. Do NOT press [Cancel].

Step 7: Once all the necessary files are copied from the Windows CD, the driver install process will be complete. Click [Finish] to exit the wizard.

Step 8: You will then be prompted to reboot the machine. Press [Yes]. Upon reboot, the SMCWUSB32 will be initialized and ready for use.

Windows ME

Step 1: After you have inserted the SMCWUSB32 in your machine and turned it back on, the OS will automatically recognize the adapter and prompt you for the appropriate drivers. Select the [Specify the location of the driver] option. Then click the [Next >] button to begin the installation.

Step 2: Insert the Driver CD and select the [Specify a location:] option. Clear the [Removable Media] checkbox. Then press the [Browse] button and look for the drivers on your CD. This should be located in ?:\Flash Driver. (Note: The ? equals the letter of your CD-ROM drive. In most cases, this is **D**.) Then click [Next >].

Step 3: The system should find the drivers. Click the [Next >] button to continue the installation.

(Note: If the system could not find the drivers, click the [< Back] button, and select the [Display a list of all the drivers] option. Select [Network Adapters] from the list of devices, press [Have Disk] and once again browse to the location of the drivers)

Step 4: Once all the necessary files have been copied, the driver installation is complete. Click [Finish] to exit the wizard.

Step 5: You will then be prompted to reboot the machine. Press [Yes]. Upon reboot, the SMCWUSB32 will be initialized and ready for use.
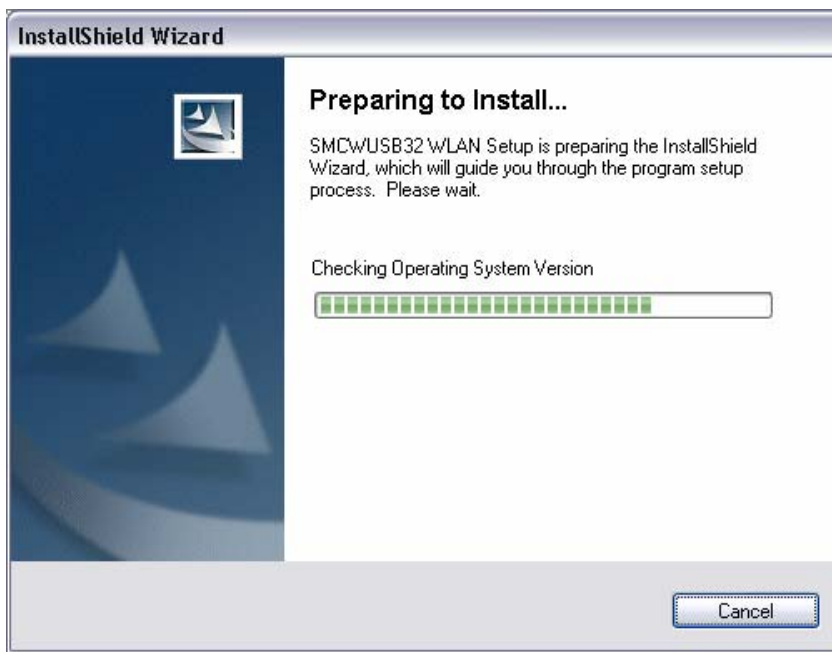
5 | WLAN Driver/Utility Installation

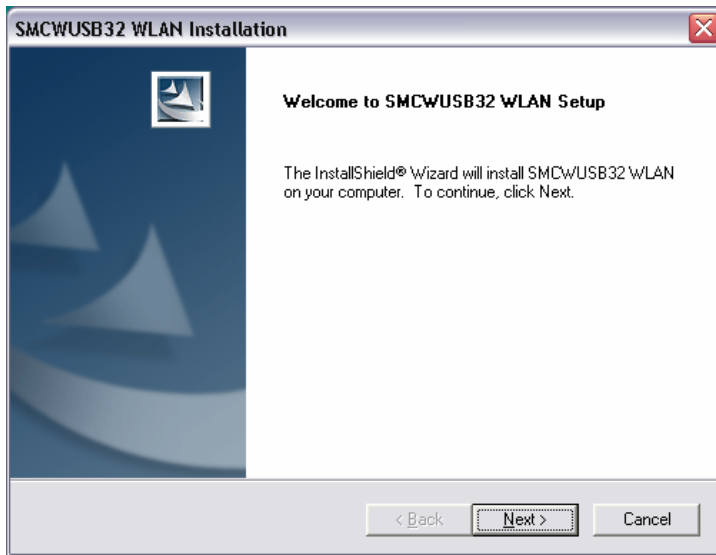**Step 1:** Insert the SMCWUSB32 EZ Installation Wizard and Documentation CD.

Step 2: Click the [Install Driver/Utility] button.
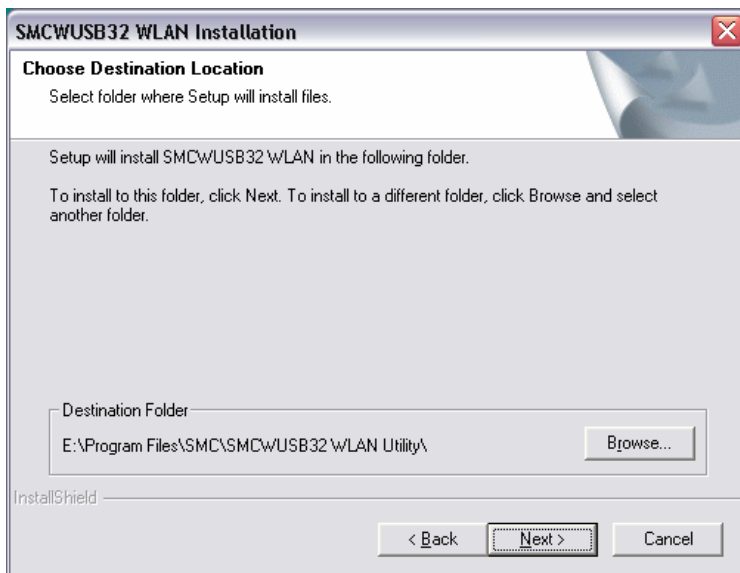

Step 3: Please wait while the utility checks your Operating System Version and prepares to install the SMCWUSB32.

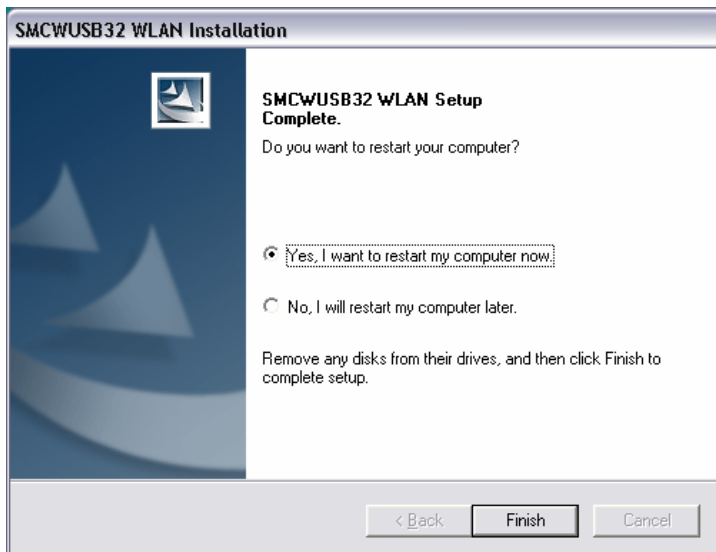**Step 4:** Click the [Next] button to continue.

Step 5: Choose the folder where the utility setup files will be installed. It is recommended to leave this value at its default setting. Click [Next] to continue.

The program files will now be copied. Please wait.

Step 6: Please restart your computer to finish the installation of the SMCWUSB32.

6 | Utility Configuration

NOTE: The following applies to Windows 98SE, Me, 2000. Under Windows XP, please use the Wireless Zero Configuration tool built into Windows XP to configure your SMCWUSB32.

When the utility program is running, there will be a quick launch icon in the lower right-hand corner of the taskbar. The icon will be GREEN if you have a good connection to a wireless network. If it is red, you will need to verify the network settings and check to be sure that the Wireless Access Point on your network is turned on. You may also need to re-position the Access Point and place it in a higher position so that you are able to gain more wireless signal strength.

Double-click the quick launch icon in the system tray to bring up the Configuration Utility. This provides quick access to management statistics and adapter settings.

The Configuration Utility includes the following tabs:

Status: Allows you to view/monitor network status, throughput, wireless channel, and TCP/IP Information.

Profile: Allows you to implement Profile Management, edit SSID data, change the Tx Rate and Operating mode, and enable 64/128-bit WEP.

Survey: Displays all the Access Points within range of the wireless adapter's signal. Allows you to select your desired WLAN.

Statistics: Displays Transmit/Receive and other data used for management and troubleshooting.

About: Shows the driver and utility version information.

Section 1.1 | Status
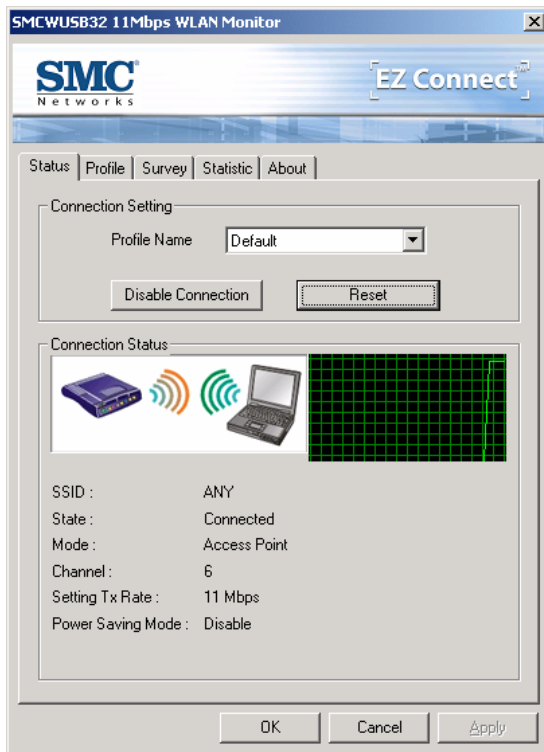
This tab will show you the current profile of the wireless card. Click [Disable Connection] to entirely halt all wirelessly functionality of the SMCWUSB32. Click [Reset] to reboot your SMCWUSB32.

Section 1.2 | Profile
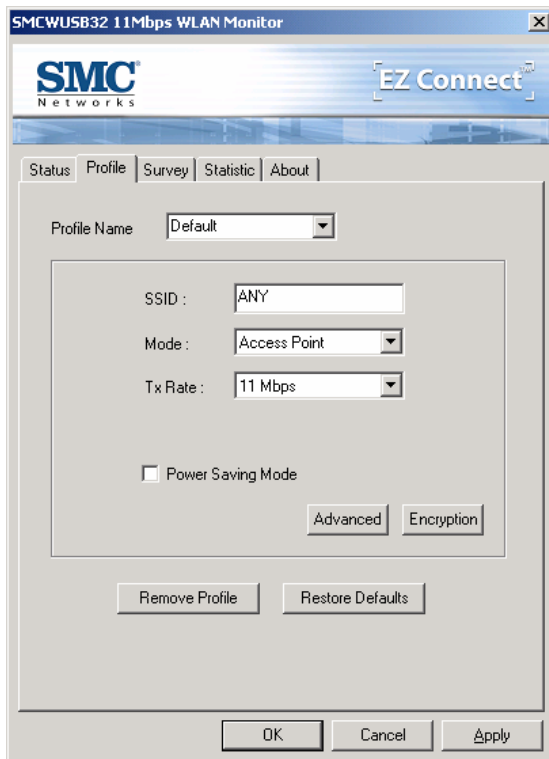

The Profile tab allows to create or delete profiles and configure the wireless network settings.

The options for Mode include Infrastructure(Access Point) and Adhoc(Peer-to-Peer). Adhoc networks consist of wireless clients only. In Infrastructure networks, wireless clients connect to wired LANs via Wireless Access Points. The Tx Rate allows you to manually set your Transmission speed over the wireless network – the options are 1Mbps, 2Mbps, Auto 1 or 2Mbps, 5.5Mbps, 11Mbps, or Fully Automatic.
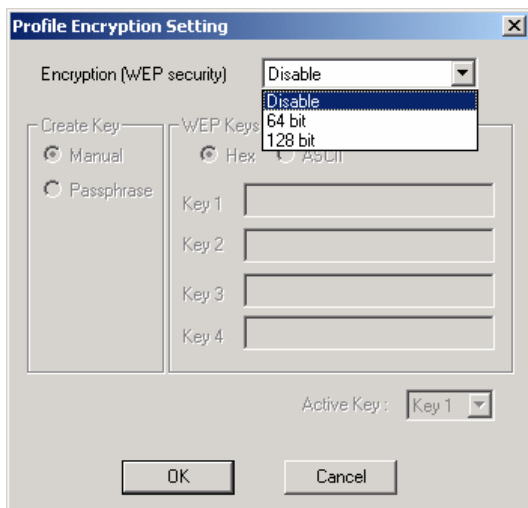
For more secure data transmissions, it is recommended to enable WEP on your WLAN. Click the [Encryption] button to get to this configuration. The utility supports HEX or ASCII key entries. For the HEX Key Format, the security is enabled by entering 10-digit keys for the 64-bit WEP configuration, and 26-digit keys for a 128-bit WEP configuration. For ASCII Key Format, the security is enabled by entering five alphanumeric characters for the 64-bit WEP configuration, and 13 alphanumeric characters for the 128-bit WEP configuration. Select the desired encryption strength (64-bit or 128-bit) and then enter the appropriate keys in Key 1, 2, 3, or 4. Remember to select the correct Default Key. You can also check the "Passphrase" option and enter the desired value. You must be sure to use the same passphrase on all other wireless clients/Access Points.
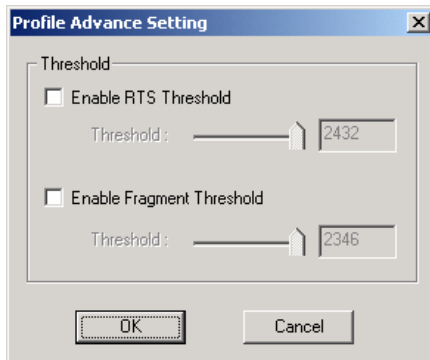

RTS Threshold
This field allows you to select enable or disable. When the field is set to Enabled, you can adjust the value between 0 to 3000. RTS threshold is a mechanism implemented to prevent the "Hidden Node" problem. "Hidden Node" is a situation in which two stations are within range of the same access point, but are not within range of each other. Thus, it provides a solution to prevent data collisions. However, enabling RTS Threshold may cause redundant network overhead that could negatively affect the throughput performance.

Fragment Threshold
This field allows you to select enable or disable. When the field is set to Enabled, you can adjust the value between 256 to 2346. Fragmentation mechanism is used for improving the efficiency when high traffic flows along in the wireless network. If your wireless devices often transmit large files in wireless network, you can enable the Fragmentation Threshold and the mechanism will split the packets being sent.

Section 1.3 | Survey

The Survey tab supports a powerful Site-Survey tool to discovery all active wireless devices in the radio range. After selecting this, other wireless devices are displayed on the screen. Users can press the [Connect] button to quickly connect to the wireless device chosen and simultaneously modify the [Default] profile automatically. If users want to update the survey result, they can press [Rescan] button again.
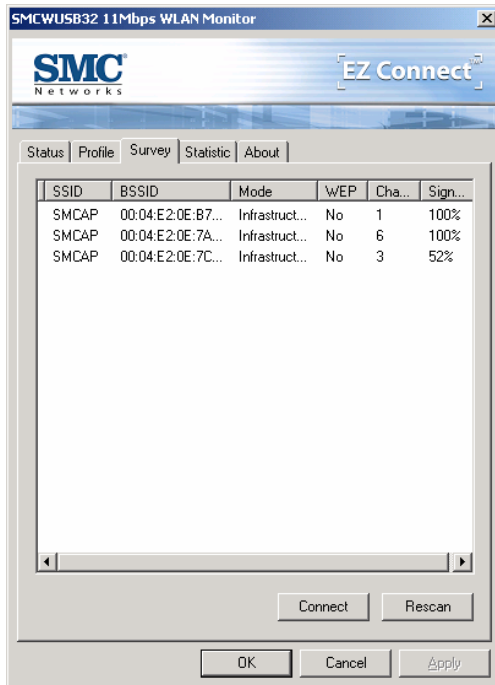
Section 1.4 | Statistics

The Statistics tab is used to monitor TX and RX traffic of the wireless network. It also offers the detailed information on error packets. Each time users switch to this page, the statistics will start counting from zero. Users can press [Reset] button if they want to restart the counter again. If users want to temporarily freeze the current counters, they can press [Pause] button.
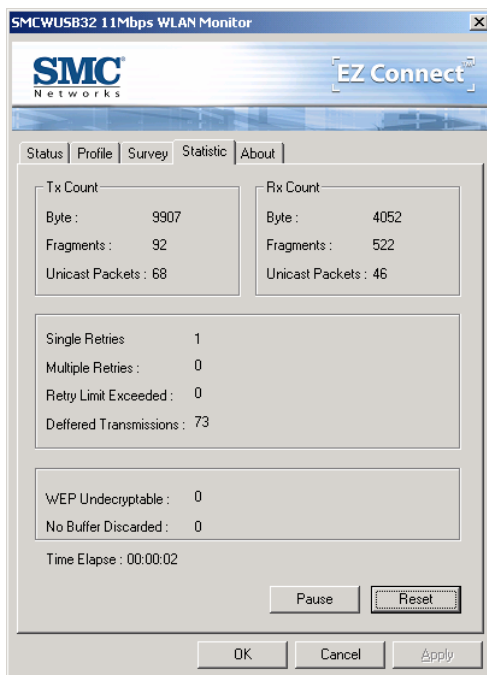
Section 1.5 | About

The About screen displays the version information and MAC address.
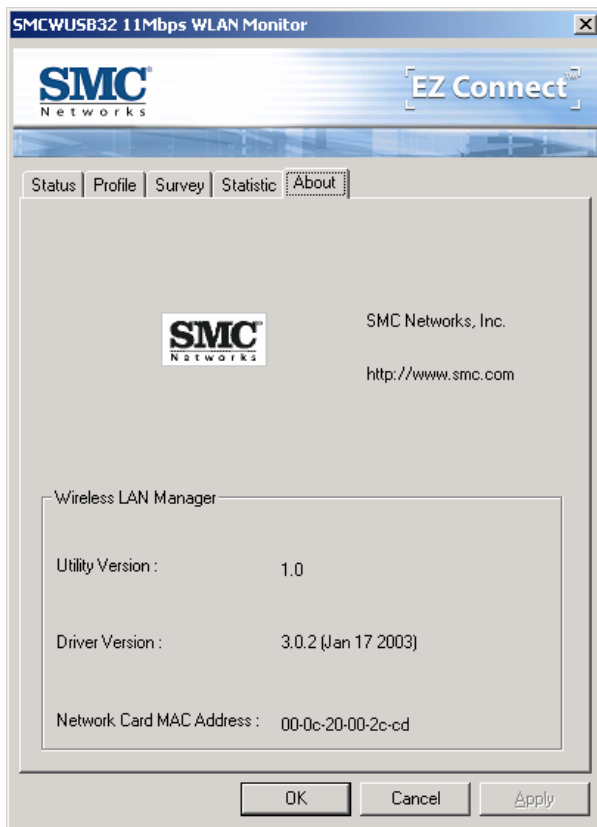
USING WIRELESS ZERO CONFIGURATION

1) After completing the driver installation, in Windows XP, the Wireless Zero Configuration will automatically be enabled. You will see a new wireless network connection in the bottom right-hand corner of your taskbar.
2) If you are not automatically connected to your wireless network, click on the wireless network icon in the system tray:

3) You should see the SSID of your Wireless Base Station or adhoc network in the "Available wireless networks" window. High-light the desired network.
4) If the network is not encrypted, you need to check the [Allow me to connect…] checkbox in order for the [Connect] button to appear. After that, click [Connect]. You will now be connected to your wireless network.

If you have advanced security such as WEP or WPA, select the [Advanced] button in the "Wireless Network Connection" window to continue:
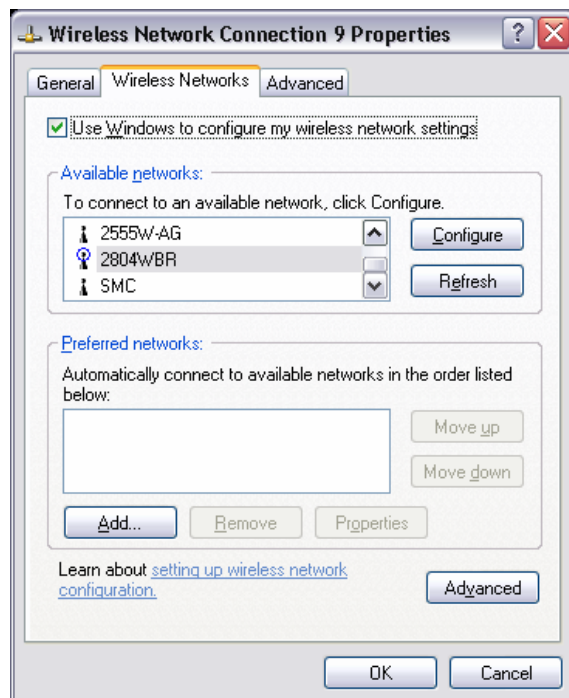
5) Select your desired network from the "Available wireless networks" window and then click [Configure].
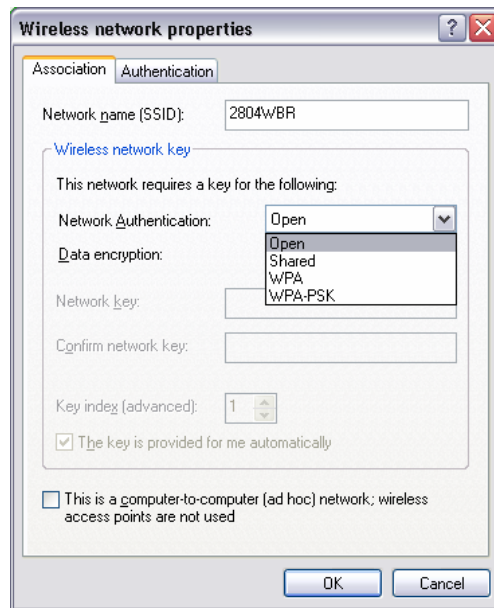
6) You will be able to select the "Network Authentication" and "Data encryption" methods. If you have 64 or 128-bit WEP enabled on your network, set the "Data encryption" to WEP, uncheck the "The key is provided for me automatically" box and enter your key in both the "Network key" and "Confirm network key" fields. If you have WPA enabled on your network, the common method is to set the "Network Authentication" to WPA-PSK and set the "Data encryption" to TKIP. Enter your network key and confirm it.

7) Then press the [OK] button. Now you will see the network's SSID listed in the "Preferred Networks" window. You have basically created a Profile for the SMCWUSB32 to use. Press [OK] to complete the network setup.

7 | Wireless Distance Table

Important Notice
Maximum distances posted below are actual tested distance thresholds. However, there are many variables such as barrier composition and construction, as well as local environmental interference that may impact your actual distances and cause you to experience distance thresholds far lower than those posted
below. If you have any questions or comments regarding the features or performance of this product, or if you would like information regarding our full line of wireless products, you can visit us at www.smc.com, or you can call us toll-free at 800.SMC.4YOU. SMC Networks stands behind every product sold
with a 30-day satisfaction guarantee and a limited-lifetime warranty.

802.11b Wireless Distance Table				
Environmental Condition	**Speed and Distance Ranges**			
	11 Mbps	5.5 Mbps	2 Mbps	1 Mbps
Outdoors: A line-of-sight environment with no interference or obstruction between the Access Point and users.	160 m (528 ft)	195 m (640 ft)	255 m (837 ft)	350 m (1,155 ft)
Indoors: A typical office or home environment with floor to ceiling obstructions between the Access Point and users.	72 m (236 ft)	73 m (240 ft)	73 m (240 ft)	75 m (246 ft)

8 | Troubleshooting

If your computer cannot find the EZ Connect Wireless USB Adapter or the network driver does not install correctly, check the following items:

- Make sure the adapter is connected to the USB port. Check for any hardware problems, such as physical damage to the adapter's connector.
- Try the adapter in another USB port. If this also fails, try using another SMCWUSB32 wireless adapter that is known to operate correctly.
- Make sure your computer is using the latest BIOS.
- If there are other network adapters in the computer, they may cause conflicts. Disable or remove all other adapters from the computer and test the wireless adapter separately.
- Check for a defective computer or USB port by trying the adapter in another computer that is known to operate correctly.

Common Installation Problems

Problems are often caused by cabling errors, conflicts with other devices installed in the same computer, or software that has been configured incorrectly. If you encounter a problem with the SMCWUSB32, use the following checklists to identify and correct the problem.

- If you're computer cannot find the SMCWUSB32, or the network driver does not install correctly, check the following items before contacting SMC Technical Support
    - Make sure the adapter is securely seated in the USB slot. Check for any hardware problems, such as physical damage to the card's edge connector.
    - Try the card in another USB slot. If this fails, test the card in a completely different system or try using a second SMCWUSB32 in that particular USB slot.
    - Make sure your computer is using the latest BIOS available. Contact the manufacturer of the computer or motherboard for information on updating the BIOS (e.g. – Dell, Toshiba, etc)
    - If there are other network cards in the computer, they may be causing conflicts. Remove all other cards from the computer and test the SMCWUSB32 separately.

Network Connection Problems

There may be a network connection problem if the LED on the card does not light, or if you cannot access any network resources from the computer. Check the following items before contacting SMC Technical Support.

- Make sure the correct network card driver is installed for your operating system. If necessary, try uninstalling and reinstalling the driver. To do this, first go into the Device Manager, select Network Adapters, and remove the SMC adapter. Then open up your Start Menu, go to Programs, click the "SMCWUSB32 WLAN Utility" program folder and choose "Uninstall". Reboot the machine when the uninstall is complete. Once you have booted up again, the OS may ask for the SMC Driver CD again. Insert your Driver CD and browse to the driver path again. Then install the utility program again.
- If you are using Windows XP and you cannot get the Wireless Zero Configuration to start or you simply do not see any wireless functionality on your system, the service may have been disabled by a third party application. Please check with Microsoft for assistance on re-enabling the service.
- Make sure the computer and other network devices are receiving power. If you suspect a power outlet to be faulty, plug another device into it to verify that it is working.

- If your wireless station cannot communicate with a computer on the Ethernet LAN when configured for Infrastructure mode, try changing the wireless channel on the AP. Make sure the SSID is the same as that used by the AP for a station with roaming disabled, or the same as that used by the AP's in the extended service set (ESS).
- The Access Point you are trying to attach to is defective or may not be configured properly to accept your signal. Check with the administrator of your wireless network for more information on connecting to the LAN. Also run the necessary diagnostics on the AP to make sure the unit is fully operational.
- If you cannot access the Internet, be sure to check with the ISP for further instructions once the drivers for the Wireless Card are installed properly.

- **What is a Wireless LAN?**
  - A local area network that transmits over the air typically in an unlicensed frequency such as the 2.4GHz band. A wireless LAN does not require lining up devices for line of sight transmission like IrDA. Wireless access points (base stations) are connected to an Ethernet hub or server and transmit a radio frequency over an area of several hundred to a thousand feet which can penetrate walls and other non-metal barriers. Roaming users can be handed off from one access point to another like a cellular phone system. Laptops use wireless network cards that plug into an existing PCMCIA slot or that are self contained on PC cards, while stand-alone desktops and servers use plug-in cards (ISA, PCI, etc.).
- **What is Ad-hoc?**
  - An AD-HOC network is a peer to peer network where all the nodes are wireless clients. As an example, two PC's with wireless adapters can communicate with each other as long as they are within range. A wireless extension point can extend the range of an AD-HOC network.
- **What is the 802.11 standard?**
  - A family of IEEE standards for wireless LANs first introduced in 1997. 802.11 provides 1 or 2 Mbps transmission in the 2.4GHz band using either a frequency hopping modulation (FHSS) technique or direct sequence spread spectrum (DSSS), which is also known as CDMA. The 802.11b standard defines an 11 Mbps data rate in the 2.4GHz band, and the 802.11a standard defines 54 Mbps in the 5GHz band.

- **What is Infrastructure?**
  - In order for your wireless components to interact with traditional wired networks they need a media bridge to translate for them. This is where INFRASTRUCTURE or Network mode comes into play. An ACCESS POINT is attached to the network using CAT-5 Ethernet cable attaching to a hub, switch or another PC. Wireless PC's can then communicate to Wired Ethernet computers through this access point. The total range of the network is limited to a radius around this Access Point. To increase the range, extra Access Points may be wired into the network. These Access Points talk to each other over the hard-wired Ethernet cables however, they cannot communicate wirelessly to one another and they must be wired to the same network. Individual wireless PC's can move between Access Points on the same network seamlessly due to a feature called ROAMING.
- **What is Tx-Rate?**
  - Tx-Rate or TRANSFER RATE is the current speed at which the network component is operating. SMC-802.11b products can operate at speeds of 1Mb, 2Mb, 5.5Mb, & 11Mbps. A wireless card set to AUTO will attempt to connect at whatever speed will give the best throughput on the network.
- **What is RTS Threshold?**
  - (Request To Send) An RS-232 signal sent from the transmitting station to the receiving station requesting permission to transmit. RTS is a collision avoidance method used by all 802.11b wireless networking devices. In most cases you will not need to activate or administer RTS. Only if you find yourself in an Infrastructure environment where all nodes are in range of the Access Point but may be out of range of each other. It is recommended to leave this setting at its default value leaving this feature disabled.

- **What is Authentication Algorithm?**
  - Authentication Algorithm is the means by which one station is authorized to communicate with another. In an Open System, any station can request authorization in accordance with the WECA standard. In a Shared key system, only stations that possess a secret encrypted key may participate in the network. This is a low level security key which allows the equipment with the shared key algorithm to see each other on the wireless LAN.
- **What is DBI?**
  - The ability of the antenna to shape the signal and focus it in a particular direction is called Antenna Gain, and is expressed in terms of how much stronger the signal in the desired direction is, compared to the worst possible antenna, which distributes the signal evenly in all directions (an Isotropic Radiator). To express the relationship to the Isotropic reference, this is abbreviated: "dBi". The typical omni-directional "stick" antenna is rated at 6-8 dBi, indicating that that by redirecting the signal that would have gone straight up or down to the horizontal level, 4 times as much signal is available horizontally. A parabolic reflector design can easily achieve 24 dBi.
- **What is WEP?**
  - Short for Wired Equivalent Privacy, WEP is a security protocol for wireless local area networks (WLANs) defined in the 802.11b and 802.11a standards.
  - WEP is designed to provide the same level of security as that of a wired LAN. LANs are inherently more secure than WLANs because LANs are somewhat protected by the physicalities of their structure, having some or all part of the network inside a building that can be protected from unauthorized access. WLANs, which are over radio waves, do not have the same physical structure and therefore are more vulnerable to tampering.
  - WEP aims to provide security by encrypting data over radio waves so that it is protected as it is transmitted from one end point to another. The Wired Equivalent Privacy (WEP) feature uses the RC4 PRNG algorithm developed by RSA Data Security, Inc.
  - If your wireless access point supports MAC filtering, it is recommended that you use this feature in addition to WEP (MAC filtering is much more secure than encryption).

10 | Technical Specifications

Standards:
IEEE 802.11b compliant

Wireless Data Rates (With Automatic Fall-back):
1/2/5.5/11 Mbps

Data Modulation Techniques:
DBPSK, DQPSK, CCK

Host Interface:
USB 1.1

Operating Range:
Up to 1,155 ft

Network Configuration:
Ad-Hoc (Peer-to-Peer)
Infrastructure

Radio Signal Type:
Direct Sequence Spread Spectrum (DSSS)

Media Access Protocol:
CSMA/CA (Collision Avoidance)

Security:
64/128-bit WEP
Wi-Fi Protected Access (WPA)*

Channel Support (2.4GHz RF):
US/Canada - 11
France - 4
Japan - 14
Europe - 13

RF Output Power:
16 dBm max.

Data Retention Period:
10 Years

Erase Cycles:
1 Million instances

Shock Resistance:
1000g

Power Consumption:
TX Power Consumption: < 310mA
RX Power Consumption: < 300mA

Read Transfer Power Consumption: < 26mA
Write Transfer Power Consumption: < 300mA
Sleep Mode Power Consumption: < 150mA

Flash Memory Size:
32MB

Flash Memory Transfer:
Read Transfer: 900KB/s
Write Transfer: 500KB/s

Operating Systems:
Windows 98SE/Me/2000/XP

Antenna Type:
Built-in

LED Indicators:
Network Link

Compliance:
USA: FCC Part 15 Class B
Europe: CE-Mark
ETSI 300.328
ETSI 300.826
Industry Canada
IEC 60950

Temperature Range:
Operating: 0 C - 55 C
Storage: 20 C - 80 C
Humidity: 5 ~ 80%

* Available in Windows XP via Wireless Zero Configuration

11 | Terminology

10BaseT - Physical Layer Specification for Twisted-Pair Ethernet using Unshielded Twisted Pair wire at 10Mbps. This is the most popular type of LAN cable used today because it is very cheap and easy to install. It uses RJ-45 connectors and has a cable length span of up to 100 meters. There are two versions, STP (Shielded Twisted Pair) which is more expensive and UTP (Unshielded Twisted Pair), the most popular cable. These cables come in 5 different categories. However, only 3 are normally used in LANs, Category 3, 4 and 5. CAT 3 TP (Twisted Pair) cable has a network data transfer rate of up to 10Mbps. CAT 4 TP cable has a network data transfer rate of up to 16Mbps. CAT 5 TP cable has a network data transfer rate of up to 100Mbps.

Access Point - A device that is able to receive wireless signals and transmit them to the wired network, and vice versa - thereby creating a connection between the wireless and wired networks.

Ad Hoc - An ad hoc wireless LAN is a group of computers, each with LAN adapters, connected as an independent wireless LAN.

Adapter - A device used to connect end-user nodes to the network; each contains an interface to a specific type of computer or system bus, e.g. EISA, ISA, PCI, PCMCIA, CardBus, etc.

Auto-Negotiation - A signaling method that allows each node to define its operational mode (e.g., 10/100 Mbps and half/full duplex) and to detect the operational mode of the adjacent node.

Backbone - The core infrastructure of a network. The portion of the network that transports information from one central location to another central location where it is unloaded onto a local system.

Base Station - In mobile telecommunications, a base station is the central radio transmitter/receiver that maintains communications with the mobile radiotelephone sets within its range. In cellular and personal communications applications, each cell or micro-cell has its own base station; each base station in turn is interconnected with other cells' bases.

Bitmap – A Windows and OS/2 bitmapped graphics file format. Bitmap files provide formats for 2, 16, 256, or 16 million colors. It uses the extension .BMP.

BSS - BSS stands for "Basic Service Set". It is an Access Point and all the LAN PCs that are associated with it.

CSMA/CA - Carrier Sense Multiple Access with Collision Avoidance

DHCP - Dynamic Host Configuration Protocol. This protocol automatically configures the TCP/IP settings of every computer on your home network.

DNS - DNS stands for Domain Name System, which allows Internet host computers to have a domain name (such as www.smc.com) and one or more IP addresses (such as 192.34.45.8). A DNS server keeps a database of host computers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing " www.smc.com" into your Internet browser), the user is sent to the proper IP address. The DNS server address used by the computers on your home network is the location of the DNS server your ISP has assigned.

DSL - DSL stands for Digital Subscriber Line. A DSL modem uses your existing phone lines to transmit data at high speeds.

Ethernet - A standard for computer networks. Ethernet networks are connected by special cables and hubs, and move data around at up to 10 million bits per second (Mbps).

ESS - ESS (ESS-ID, SSID) stands for "Extended Service Set". More than one BSS is configured to become an Extended Service Set. LAN mobile users can roam between different BSSs in an ESS (ESS-ID, SSID).

Fast Ethernet NIC - Network interface card that is in compliance with the IEEE 802.3u standard. This card functions at the media access control (MAC) layer, using carrier sense multiple access with collision detection (CSMA/CD).

Fixed IP – (see Static IP)

Full-Duplex - Transmitting and receiving data simultaneously. In pure digital networks, this is achieved with two pairs of wires. In analog networks, or digital networks using carriers, it is achieved by dividing the bandwidth of the line into two frequencies, one for sending, one for receiving.

Hub - Central connection device for shared media in a star topology. It may add nothing to the transmission (passive hub) or may contain electronics that regenerate signals to boost strength as well as monitor activity (active/intelligent hub). Hubs may be added to bus topologies; for example, a hub can turn an Ethernet network into a star topology to improve troubleshooting.

ID3 – The data fields in an MP3 that hold the artist name, track titles, album titles, genre, etc are known as ID3 tags.

IP Address - IP stands for Internet Protocol. An IP address consists of a series of four numbers separated by periods, that identifies an single, unique Internet computer host. Example: 192.34.45.8.

ISP - Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

JPEG – Joint Photographic Experts Group. JPEG is a standard for compressing still images and it provides compression with ratios up to 100:1. File extensions are .JPG or .JPEG.

LAN - A communications network that serves users within a confined geographical area. It is made up of servers, workstations, a network operating system and a communications link. Servers are high-speed machines that hold programs and data shared by network users. The workstations (clients) are the users' personal computers, which perform stand-alone processing and access the network servers as required.

Diskless and floppy-only workstations are sometimes used, which retrieve all software and data from the server. Increasingly, "thin client" network computers (NCs) and Windows terminals are also used. A printer can be attached locally to a workstation or to a server and be shared by network users. Small LANs can allow certain workstations to function as a server, allowing users access to data on another user's machine. These peer-to-peer networks are often simpler to install and manage, but dedicated servers provide better performance and can handle higher transaction volume. Multiple servers are used in large networks.

The message transfer is managed by a transport protocol such as TCP/IP and NetBEUI. The physical transmission of data is performed by the access method (Ethernet, Token Ring, etc.),

which is implemented in the network adapters that are plugged into the machines. The actual communications path is the cable (twisted pair, coax, optical fiber) that interconnects each network adapter.

MAC Address - MAC (Media Access Control) A MAC address is the hardware address of a device connected to a network.

MDI / MDI-X - Medium Dependent Interface - Also called an "uplink port," it is a port on a network hub or switch used to connect to other hubs or switches without requiring a crossover cable. The MDI port does not cross the transmit and receive lines, which is done by the regular ports (MDI-X ports) that connect to end stations. The MDI port connects to the MDI-X port on the other device. There are typically one or two ports on a device that can be toggled between MDI (not crossed) and MDI-X (crossed).

Medium Dependent Interface – X (crossed) - A port on a network hub or switch that crosses the transmit lines coming in to the receive lines going out.

MP3 – MPEG Audio Layer 3. This is an audio compression technology that is included in the MPEG-1 and -2 specifications. MP3 encoding can allow you to compress CD-quality sound by a factor of 12.

MPEG – Moving Pictures Experts Group. MPEG is a standard for compressing video. MPEG-1 can provide resolution of 352x240 at 30 frames/second (fps) with 24-bit color and CD-quality sound. MPEG-2 can provide resolution of 704x480. MPEG uses the same intraframe coding as JPEG for individual frames, but also uses interframe coding which can help to further compress the video data, thereby reducing the overall size of the video.

NAT – (Network Address Translation) This process allows all of the computers on your home network to use one IP address. The NAT capability of the Barricade, allows you to access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP. Network Address Translation can be used to give multiple users access to the Internet with a single user account, or to map the local address for an IP server (such as Web or FTP) to a public address. This secures your network from direct attack by hackers, and provides more flexible management by allowing you to change internal IP addresses without affecting outside access to your network. NAT must be enabled to provide multi-user access to the Internet or to use the Virtual Server function.

Packet Binary Convulational Code(tm) (PBCC) - A modulation technique developed by Texas Instruments Inc. (TI) that offers data rates of up to 22Mbit/s and is fully backward compatible with existing 802.11b wireless networks.

PCI - Peripheral Component Interconnect - Local bus for PCs from Intel that provides a high-speed data path between the CPU and up to 10 peripherals (video, disk, network, etc.). The PCI bus runs at 33MHz, supports 32-bit and 64-bit data paths, and bus mastering.

PPPoE - Point-to-Point Protocol over Ethernet. Point-to-Point Protocol is a method of secure data transmission originally created for dial-up connections. PPPoE is for Ethernet connections.

Roaming - A function that allows your to move through a particular domain without losing network connectivity.

Static IP - If your Service Provider has assigned a fixed IP address; enter the assigned IP address, subnet mask and the gateway address provided by your service provider.

Subnet Mask - A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet.

TCP/IP - Transmission Control Protocol/Internet Protocol. This is the standard protocol for data transmission over the Internet.

TCP - Transmission Control Protocol - TCP and UDP (User Datagram Protocol) are the two transport protocols in TCP/IP. TCP ensures that a message is sent accurately and in its entirety. However, for real-time voice and video, there is really no time or reason to correct errors, and UDP is used instead.

UDP - User Datagram Protocol - A protocol within the TCP/IP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

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